Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Reliability and Continuity of Communications Networks, Including Broadband Technologies	)	PS Docket No. 11-60
	)	
Effects on Broadband Communications Networks of Damage or Failure of Network Equipment or Severe Overload	)	PS Docket No. 10-92
	)	
Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks	)	EB Docket No. 06-119

COMMENTS OF IRIDIUM SATELLITE LLC

Iridium Satellite LLC ("Iridium") hereby submits these comments in response to the Commission's request for comment on its Notice of Inquiry Regarding Network Reliability and Continuity ("*Network Reliability NOI*").[1] In the *Network Reliability NOI*, the Commission rightly recognizes the critical importance of ensuring that communications networks are reliable and resilient, especially during times of emergency. Iridium is the only mobile satellite communications provider capable of providing service to all parts of the globe. This allows Iridium to serve remote domestic and international areas that other telecommunications operators are unable to reach.

[1] *In the Matter of Reliability and Continuity of Communications Networks, Including Broadband Technologies; Effects on Broadband Communications Networks of Damage or Failure of Network Equipment or Severe Overload; Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks*, Notice of Inquiry, PS Docket Nos. 11-60, 10-92; EB Docket No. 06-119 (rel. April 7, 2011).

Iridium's robust mobile satellite service ("MSS") network has played a critical role during national emergencies, such as Hurricanes Katrina and Rita, as well as international emergencies, such as the recent earthquakes in Haiti, Chile, and Japan. Iridium also provides vital services to the Department of Defense and many Federal U.S. bureaus, agencies and departments, including serving the critical and secure needs of U.S. and Coalition Forces at home and abroad. Moreover, Iridium's network of sixty-six (66) active low earth orbiting satellites and extensive ground infrastructure contain multiple layers of redundancy and backup protection for all critical features to ensure network reliability during times of emergency.

I. IRIDIUM PROVIDES CRITICAL COMMUNICATIONS SERVICES TO FIRST RESPONDERS, GOVERNMENT ENTITIES, CORPORATIONS, AND PRIVATE CITIZENS DURING AND AFTER MAJOR EMERGENCIES.

As a major provider of emergency communications services in the United States and around the world, Iridium agrees with the Commission's assertion that "It is critical that our Nation have access to reliable and resilient communications networks, especially during times of major emergencies, such as large-scale natural and man-made disasters."[2] Through Iridium's MSS system, Iridium and its partners have played a vital and growing role in communications during national and international emergencies, including during Hurricanes Katrina and Rita and the recent earthquakes in Haiti, Chile, and Japan. Iridium's robust MSS system provides these critical communications services to first responders, the Federal Government, aid organizations, and private users.

[2] *Network Reliability NOI* ¶15.

Notably, in the aftermath of Hurricane Katrina, Iridium worked quickly to get mobile satellite communications equipment into the hands of first responders at the federal, state and local levels. To meet the skyrocketing demand and ensure that equipment was delivered to critical service providers in a timely fashion, Iridium immediately adopted an around-the-clock manufacturing schedule. Within the first seventy-two (72) hours of the disaster, Iridium traffic in the affected region increased more than 3,000 percent, while the number of Iridium subscribers increased more than 500 percent. Notably, Brigadier General Mark A. Graham recognized the critical importance of Iridium satellite communications in his testimony before the Senate Committee on Homeland Security and Government Affairs when he noted that in the aftermath of Katrina, "All of our command and control nodes were used to coordinate and synchronize our 24-hour evacuation operations. We provided our own communications using Iridium satellite phones and intermittent Blackberry coverage. During the evening of Thursday, September 1, the OCP was augmented with an additional 28 soldiers and Department of the Army civilians from Fifth U.S. Army. This allowed us to better maintain 24-hour operations. Utilizing this network, by the end of the day on September 1, we had evacuated approximately 15,000 displaced persons out of the City of New Orleans."[3]

Iridium's services have also played a vital role in preparing for domestic emergencies. For instance, since 2003, the U.S. National Oceanic and Atmospheric Administration ("NOAA") has depended on Iridium's services to operate its tsunami

[3] *Hurricane Katrina: Managing the Crisis and Evacuating New Orleans: Hearing Before the United States Senate Committee on Homeland Security and Government Affairs*, Testimony of Brigadier General Mark A. Graham, 109th Congress (February 1, 2006).

warning system, which utilizes satellite data links to transmit real-time data from deep ocean buoys. This warning system allowed NOAA to monitor the tsunami heading towards Hawaii after the Chilean earthquake as well as the aftereffects of the Japanese earthquake. In addition, Iridium currently provides critical backup and support services to MedSTAR Health with satellite phones and airtime for MedSTAR Health's facilities in the Washington, DC region, enabling existing systems to be used even when traditional phone service is unavailable. Iridium's automated tracking and voice services were also installed in MedSTAR Health's transport helicopter fleet, enabling MedSTAR Health to view the location and status of its fleet and allow its helicopters to communicate with hospitals.

Iridium's satellite communications network was also deployed in innovative ways to assist in the cleanup and recovery effort after the April 2010 explosion of the Deepwater Horizon oil rig and the subsequent oil spill in the Gulf of Mexico. By incorporating Iridium satellite transceivers into robots and buoys that can be deployed on site, researchers and other relief workers were able to monitor and track the movements of the oil spill in real time, greatly improving the efficiency of cleanup efforts.

On the international stage, after the devastating earthquake in Haiti, Iridium and its partners delivered communications services critical to the coordination of relief and rescue efforts. Relief organizations—including United Nations agencies, the American Red Cross, FEMA, the U.S. Department of Defense, the U.S. State Department, the Mexican Red Cross and others—relied on Iridium handsets and equipment for their communications needs in Haiti. Similarly, in the aftermath of the earthquake in Chile in February 2010, Iridium's services proved to be essential. Indeed, Secretary of State

Hillary Clinton personally delivered twenty (20) satellite phones to Chile within days of the earthquake.[4]

Iridium also assisted in reestablishing domestic and international communications in Japan following the devastating earthquake and tsunami in March 2011. To ensure that Iridium services reached critical government, military, and first responder users as quickly as possible, Iridium worked directly with Japan's major telecom company, KDDI, to ensure activation of the Iridium systems already in place in Japan and ship thousands of new handsets to appropriate personnel.

II. IRIDIUM'S SPACE AND GROUND BASED SYSTEMS PROVIDE INDUSTRY LEADING RESILIENCY AND RELIABILITY.

A. SATELLITE CONSTELLATION

Iridium's satellite constellation consists of sixty-six (66) cross-linked operational satellites, plus in orbit spares, operating in near circular low earth orbits approximately 483 miles above the earth's surface. There are eleven (11) satellites in each of six (6) orbital planes whose orbits roughly intersect over the north and south poles. Each satellite can project forty-eight (48) spot beams onto the earth's surface. Each of these beams is approximately 250 miles in diameter and all of the spot beams and satellite footprints overlap. Each satellite in Iridium's constellation communicates with other nearby satellites in adjacent orbits, handing off voice or data communications from one spot beam to another within the satellite footprint and from one satellite to the next as

[4] *See* Sarah Miller Llana, *Chile Earthquake: Hillary Clinton Arrives With Satellite Phones*, The Christian Science Monitor, March 2, 2010, available at: http://www.csmonitor.com/World/Americas/2010/0302/Chile-earthquake-Hillary-Clinton-arrives-with-satellite-phones.

they pass overhead. Thus, voice and data communications are relayed around the orbital network without touching ground until the point at which they are transmitted to an Iridium gateway and transferred to the public switched telephone network.

Iridium's unique network architecture provides inherent advantages in both performance and reliability as compared to other MSS operators and allows Iridium to provide service to remote areas – including Alaska, Hawaii, and the Polar Regions – that other MSS operators are unable to reach. Notably, since more than one satellite is typically available from any given location on earth, there is a high degree of overlap and redundancy built into the system which minimizes missed connections and dropped calls. In addition, each satellite has multiple layers of onboard redundancy for critical system components and an onboard fault detection system to identify and mitigate any anomalies that may occur.

Moreover, in the event that a satellite or network link does malfunction, Iridium's network architecture ensures that: (1) inter-satellite traffic can be expeditiously re-routed to undamaged pathways within the constellation; (2) in-orbit spares can be repositioned quickly and effectively to address any coverage gaps; and (3) any actual service outage will be highly localized.

B. GROUND INFRASTRUCTURE

Iridium's unique low earth orbit satellite network is supported by an extensive, interconnected ground-based network that provides terrestrial connections for satellite voice and data communications as well as command, control, and network support services. Iridium's terrestrial network includes multiple layers of redundancy and backup systems for all critical functions to ensure the reliability of the network as a whole.

Notably, each Iridium ground station has an uninterruptible power supply that maintains power to critical systems in the event of a commercial power outage and an independent diesel generator capable of providing power to critical systems for an extended period of time. Iridium's terrestrial network also has redundant fiber loops in place connected to several different public switched telephone networks and internet carriers to mitigate the risk of failure from a single terrestrial network provider.

The twin hubs of Iridium's terrestrial network are the Satellite Network Operating Center ("SNOC") in Leesburg, Virginia and Iridium's primary gateway facilities in Tempe, Arizona ("Gateway"). The SNOC serves as the nerve center of Iridium's state of the art satellite network. The SNOC is connected to Iridium's terrestrial network via a dedicated fiber-optic system which directs and carries data to remote antennas and other ground-based facilities. The SNOC and its staff provide 24/7 monitoring and control over all network elements, including the satellites, ground sites and interconnections as well as trending and performance analyses to ensure quality of service requirements are met. Iridium also has a backup command center with fully redundant functionality.

The Gateway is the landing point for Iridium's commercial voice and data traffic, providing connections to the public switched telephone network and the Internet cloud. The Gateway is constantly monitored by a team of highly skilled engineers and technicians to ensure that the quality and reliability of all of Iridium's network connections are consistently maintained. Iridium also has a back-up gateway in Alaska to protect network communications in the event of a localized emergency outage in Arizona.

All manner of emergencies, from earthquakes and tornadoes to man-made disasters have the potential to disrupt terrestrial communications networks. However, as illustrated by the examples above, Iridium's unique network facilities allow it to continue operating during and after emergencies that would shutdown terrestrial operators. Indeed, by operating a centralized gateway and SNOC with geographically separate back up facilities, Iridium ensures that its network operations will not be affected even by localized disasters that could disrupt its terrestrial infrastructure in a given area.

III. CONCLUSION

Iridium applauds the Commission for continuing to recognize the critical importance of reliable communications networks, especially during times of emergency, and thanks the Commission for allowing it to participate in this proceeding.

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